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INDUSTRIAL WASTE TREATMENT. ORIGIN AND CHARACTER OF INDUSTRIAL WASTES

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INDUSTRIAL WASTE TREATMENT

Origin and Character of Industrial Wastes

I. INTRODUCTION

Every reasonable possibility of waste prevention and by-product recovery should be explored before consideration is given to industrial waste treatment.

II. INDUSTRIAL WASTE SURVEYS

A. The principal objectives of a comprehensive industrial waste survey are to determine the source, quantity, characteristics, and concentrations of each major individual waste. This information is essential to a complete understanding of the problem.

B. The technical staff for an industrial waste survey should include an engineer, a chemist, and a biologist.

C. Sufficient information should be made available on process and plant operation to permit interpretation of the analytical data obtained from the survey.

D. The length of time required to conduct an industrial waste survey will depend on the magnitude of the problem; it may vary from two weeks to two months.

E. The survey report should describe the plant processes, and project in sufficient detail to make the work and data a useful permanent record.

III. FACTORS INFLUENCING WASTES

A. Production fluctuates with demand and sales.

B. Processes are always subject to change and new products introduce new wastes.

C. Shifting from scarce to abundant raw materials is frequently an economic necessity.

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D. Water use and re-use practices both enter in.

E. Improved technology and new process equipment may readily alter waste characteristics.

IV. SEPARATE TREATMENT OF INDUSTRIAL WASTES

A. Petroleum Refinery Wastes

1. Segregation
2. Individual treatment for emulsions and spent chemicals
3. Oil-water separation
4. Chemical flocculation of oily wastes
5. Biological oxidation of refinery phenolics
6. Centrifugation and incineration of oily sludges and black water

B. Integrated Steel Mills

1. By-product coke wastes
2. Blast furnace departments
3. Steel rolling mills

C. Paper Industry

1. Sulfite pulp mills
2. Kraft and soda pulp wastes
3. Semi-chemical pulp operations
4. Specialty mills
5. Re-use, recovery, by-products

D. Automotive Industry

1. Soluble oil coolants and emulsion cleaners from machine shops
2. Suspended solids from foundry operation

E. Metal Plating

1. Alkaline chlorination for destruction of cyanide
2. Use of sulfites to reduce hexavalent chromium to the trivalent form.

F. Textile Industry

1. Wool scouring wastes
2. Use of low BOD process chemicals
3. Combined treatment gaining favor
4. Chemical precipitation

G. Tanneries

1. Combined treatment
2. Storage and controlled release
3. Primary sedimentation in large earthen basins
4. Spray irrigation

H. Petrochemicals

1. Integration of waste disposal into manufacturing operations
2. Incineration of organic wastes
3. Chemical treatment - steam stripping
4. Solar evaporation

I. Pharmaceuticals

1. Biological filtration preceded by extended aeration
2. Deep injection wells
3. Combined treatment
4. Activated sludge

J. Dairy Industry

1. Aeration

2. Activated sludge
3. Biological filtration
4. Soil disposal

K. Food Processing Industry

1. Lagoons and irrigation systems
2. All other types of treatment

L. Meat Industry

1. Chemical treatment
2. Trickling filters including washable roughing filters

V. COMBINED TREATMENT OF DOMESTIC AND INDUSTRIAL WASTES

A. Unacceptable wastes include any material which, either by itself or through reaction with another, interferes with normal functioning of sewers or the operation of a sewage treatment works.

B. Segregation of wastes from clean waters

C. Controlled discharge and pretreatment

D. Treatment works design

E. Treatment works operation

F. Problems that may develop from combined treatment

G. Reimbursement for treatment of industrial wastes in municipal plants.

VI. IMPORTANCE OF RESEARCH

A. Research will always play an important role in the solution of industrial waste treatment problems.

B. There is usually need for fundamental, applied, and investigational research.

C. Coordinated research on an industry-wide basis should give maximum return on the investment and most rapid progress.

VII. REVIEW OF CURRENT PRACTICES AND WASTE TREATMENT TRENDS

VIII. SUMMARY

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